

# PATENT ABSTRACTS OF JAPAN

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(54) ORGANIC LITHIUM PHOSPHATE AND NON-AQUEOUS ELECTROLYTE CELL USING THE SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a new organic lithium phosphate high in oxidation decomposition potential and useful as an electrolytic component for a non-aqueous electrolytic liquid.

SOLUTION: This compound is shown by formula I [R1 to

R4 are each e.g. H, a halogen, (substituted) 1-3C

hydrocarbon], e.g. tris[1,2-benzenediolato (2-)-O,O']

lithium phosphate. The compound of formula I is

obtained by reacting a compound of formula II with

phosphorus pentachloride in organic solvent and then

reacting the thus obtained compound with alkyl lithium

pref. normal butyl lithium in organic solvent. In the

reaction, it is preferable to use a compound of formula II

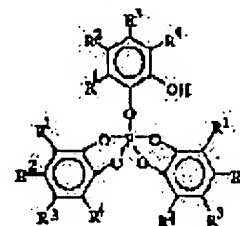
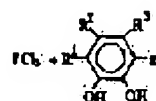
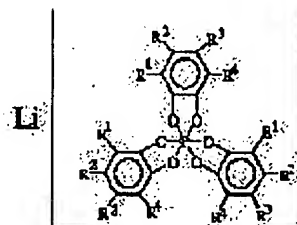
in the equivalent ratio of 3 to 5 to the phosphorous

pentachloride. An aprotic solvent e.g. carbonates allowed to dissolve the compound may be

used as a solvent for a non-aqueous electrolytic liquid comprising the compound of formula I

as an electrolyte, and the non-aqueous electrolytic liquid comprises the electrolyte in the

content of 0.1 mol/dm<sup>3</sup> to saturation point.



## LEGAL STATUS

## \* NOTICES \*

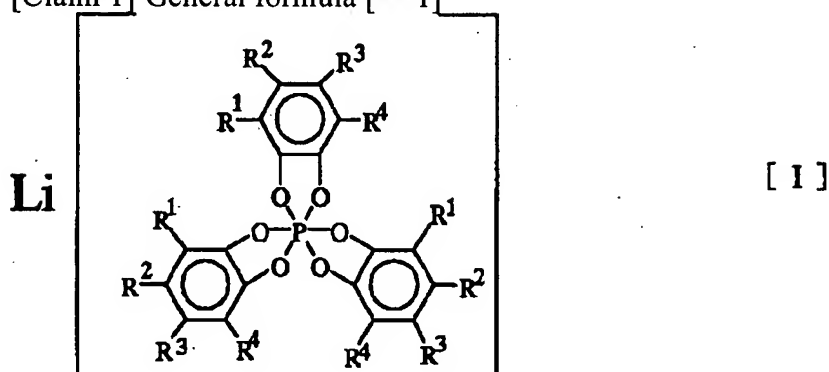
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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## CLAIMS

[Claim(s)]

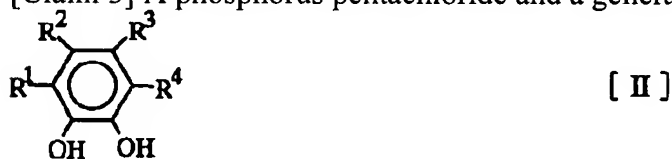
[Claim 1] General formula [\*\* 1]



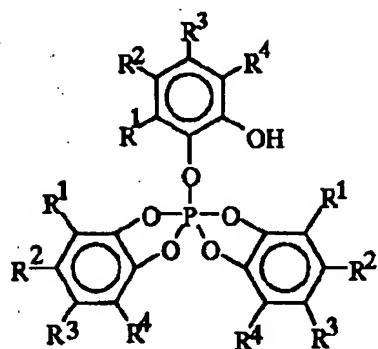
(Among a formula, a hydrogen atom, a halogen atom, and a carbon number may express the hydrocarbon group of 1-3, and the hydrocarbon group of the carbon numbers 1-3 which have a halogen atom as a substituent, may join together still more nearly mutually, and R1, R2, R3, and R4 may form a chain respectively independently.) The organic phosphorus acid lithium compound expressed.

[Claim 2] The compound according to claim 1 whose R1, R2, R3, and R4 in a general formula [I] are a hydrogen atom or a fluorine atom respectively independently.

[Claim 3] A phosphorus pentachloride and a general formula [\*\* 2]

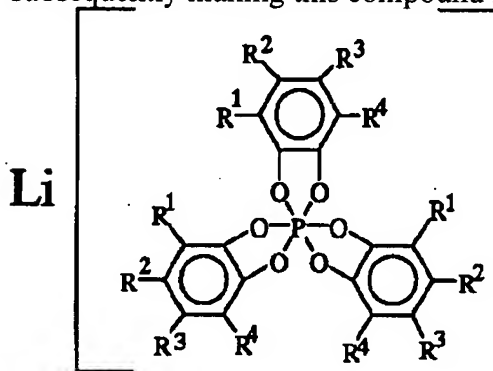


(Among a formula, a hydrogen atom, a halogen atom, and a carbon number may express the hydrocarbon group of 1-3, and the hydrocarbon group of the carbon numbers 1-3 which have a halogen atom as a substituent, may join together still more nearly mutually, and R1, R2, R3, and R4 may form a chain respectively independently.) The compound expressed is made to react and it is a general formula [\*\* 3].



[ III ]

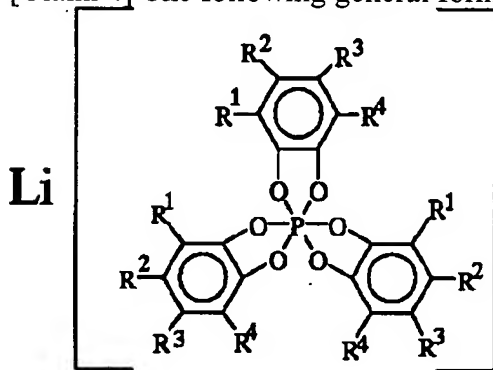
The general formula which comes out, compounds the compound expressed and is characterized by subsequently making this compound react with alkyl lithium [\*\* 4]



[ I ]

(Among a formula, a hydrogen atom, a halogen atom, and a carbon number may express the hydrocarbon group of 1-3, and the hydrocarbon group of the carbon numbers 1-3 which have a halogen atom as a substituent, may join together still more nearly mutually, and R1, R2, R3, and R4 may form a chain respectively independently.) The manufacture approach of a compound expressed.

[Claim 4] The following general formula [\*\* 5]



[ I ]

(Among a formula, a hydrogen atom, a halogen atom, and a carbon number may express the hydrocarbon group of 1-3, and the hydrocarbon group of the carbon numbers 1-3 which have a halogen atom as a substituent, may join together still more nearly mutually, and R1, R2, R3, and R4 may form a chain respectively independently.) Nonaqueous electrolyte characterized by containing the compound expressed.

[Claim 5] The nonaqueous electrolyte cell characterized by using nonaqueous electrolyte according to claim 4 in the positive electrode which consists a lithium of occlusion and matter which can be emitted, the negative electrode which consists a lithium metal or a lithium of occlusion and matter which can be emitted, and the nonaqueous electrolyte cell constituted by a separator and nonaqueous electrolyte.

[Translation done.]